1337
8853

CONTENTS.

	Page
Proceedings of the Summer Meeting, held at Washington, August 24 and 25, 1891; H. L. FAIRCHILD, *Secretary*	1
Session of Monday Morning, August 24	2
Election of Fellows	2
Memorial Sketch of Alexander Winchell	3
A geological Map of South America (abstract); by GUSTAV STEINMANN	13
On the Permian, Triassic and Jurassic Formations in the East Indian Archipelago (discussion by C. A. White and L. F. Ward); by AUGUST ROTHPLETZ	14
Thermometamorphism in igneous Rocks; by ALFRED HARKER	16
Afternoon Session, August 24	23
The Plant-bearing Deposits of the American Trias; by LESTER F. WARD	23
Studies in problematic Organisms—the Genus *Scolithus;* by J. F. JAMES	32
The Tertiary Iron Ores of Arkansas and Texas; by R. A. F. PENROSE, Jr.	44
Sandstone Dikes in northwestern Nebraska; by ROBERT HAY	50
Evening Session of Monday, August 24	55
Session of Tuesday Morning, August 25	56
Eulogium of Alexander Winchell	56
The *Eurypterus* Beds of Oesel as compared with those of North America (abstract); by FRIEDRICH SCHMIDT	59
On the marine Beds closing the Jurassic and opening the Cretaceous, with the History of their Fauna; by ALEXIS PAVLOW	61
Quaternary Changes of Level in Scandinavia; by GERARD DE GEER	65
The "Black Earth" of the Steppes of southern Russia; by A. N. KRASSNOF	68
On the Existence of the *Dinotherium* in Roumania; by GREGOIRE STEFANESCU	81
Afternoon Session, Tuesday, August 25	83
The Eleolite-Syenite of Beemerville, New Jersey (abstract); by J. F. KEMP	83
Notes on the Texas-New Mexican Region; by R. T. HILL	85
The Relation of the American and European echinoid Faunas; by J. W. GREGORY	101
The Missouri Coal Measures and the Conditions of their Deposition; by ARTHUR WINSLOW	109
The Pelvis of a *Megalonyx* and other Bones from Big Bone Cave, Tennessee; by JAMES M. SAFFORD	121
The Cienegas of southern California; by E. W. HILGARD	124
The Chattahoochee Embayment; by L. C. JOHNSON	128

Page

Peculiar geologic Processes on the Channel Islands of California (abstract); by LORENZO G. YATES..... 133
Inequality of Distribution of the englacial Drift; by WARREN UPHAM..... 134
Effects of Drought and Winds on alluvial Deposits in New England; by HOMER T. FULLER..... 148
A Deep Boring in the Pleistocene near Akron, Ohio; by E. W. CLAYPOLE..... 150
Register of the Washington Summer Meeting, 1891..... 152
Preliminary Notes on the Discovery of a vertebrate Fauna in Silurian (Ordovician) Strata; by C. D. WALCOTT..... 153
Certain extra-morainic Drift Phenomena of New Jersey; by R. D. SALISBURY. 173
On the northward and eastward Extension of the pre-Pleistocene Gravels of the Mississippi Basin; by R. D. SALISBURY..... 183
The Mannington Oil Field and the History of its Development; by I. C. WHITE..... 187
Fossil Plants from the Permian Beds of Texas; by I. C. WHITE..... 217
Notes on the Geology of the Valley of the middle Rio Grande; by E. T. DUMBLE..... 219
Eleolite-Syenite of Litchfield, Maine, and Hawes' Hornblende-Syenite from Red Hill, New Hampshire; by W. S. BAYLEY..... 231
A Revision and Monograph of the Genus *Chonophyllum*; by W. H. SHERZER.. 253
The Principal Mississippian Section; by C. R. KEYES..... 283
Two Montana Coal Fields; by W. H. WEED..... 301
Paleozoic Formations of southeastern Minnesota; by C. W. HALL and F. W. SARDESON..... 331
Geology of the Taylorville Region of California; by J. S. DILLER..... 369
Jura and Trias at Taylorville, California; by ALPHEUS HYATT..... 395
Stratigraphy and Succession of the Rocks of the Sierra Nevada of California; by J. E. MILLS..... 413
The Geology of the Crazy Mountains, Montana; by J. E. WOLFF..... 445
Proceedings of the Fourth Annual Meeting, held at Columbus, Ohio, December 29, 30, and 31, 1891; H. L. FAIRCHILD, *Secretary*..... 453
Session of Tuesday, December 29..... 454
Election of Officers and Fellows..... 454
Memorial of John Francis Williams..... 455
Fossil Plants from the Wichita or Permian Beds of Texas (discussion by E. W. Claypole, Alpheus Hyatt and E. T. Dumble); by I. C. WHITE..... 459
Secondary Banding in Gneiss; by WILLIAM H. HOBBS..... 460
Paleozoic Formations of southeastern Minnesota (discussion by W J McGee and C. W. Hall); by C. W. HALL and F. W. SARDESON.... 464
Evening Session of Tuesday, December 29..... 465
Session of Wednesday, December 30..... 466
Report of the Council..... 466
Second Annual Report of the Committee on Photographs..... 470
Notes on the Geology of the Valley of the middle Rio Grande (discussion by W J McGee); by E. T. DUMBLE..... 483

Page

Relationship of the glacial Lakes Warren, Algonquin, Iroquois and Hudson-Champlain (abstract); by WARREN UPHAM 484
The Iroquois Shore north of the Adirondacks; by J. W. SPENCER .. 488
Channels over Divides not Evidence per se of glacial Lakes; by J. W. SPENCER 491
Notes on the Geology of the Yukon Basin (abstract); by C. W. HAYES 495
Geology of the Pribilof Islands; by J. STANLEY-BROWN 496
Session of Thursday, December 31 500
The Gulf of Mexico as a Measure of Isostasy (abstract); by W J McGEE 501
Supposed interglacial Shell-beds in Shropshire, England; by G. F. WRIGHT 505
The Champlain Submergence (abstract); by WARREN UPHAM 508
Note on the Middleton Formation of Tennessee, Mississippi and Alabama; by J. M. SAFFORD 511
Paleaster eucharis; by A. H. COLE 512
On the Structure and Age of the Stockbridge Limestone in the Vermont Valley; by T. N. DALE 514
A Contribution to the Geology of the Great Plains; by ROBERT HAY 519
Register of the Columbus Meeting, 1891 522
List of Officers and Fellows of the Geological Society of America 522
Index to Volume 3 531

ILLUSTRATIONS.

Frontispiece—Portrait of ALEXANDER WINCHELL 1
Plate 1—PENROSE: Map showing the Tertiary Iron Ores in Arkansas and Texas 45
" 2—DE GEER: Map of the late glacial marine Area in southern Sweden 65
" 3—WALCOTT: Silurian (Ordovician) Fish Remains from Colorado 172
" 4 " Silurian (Ordovician) Fish Remains from Colorado 172
" 5 " Microscopic Sections of Silurian (Ordovician) Fish Remains from Colorado 172
" 6—WHITE: Map of "Big Injun" Oil Belt 216
" 7—BAYLEY: Microstructure of Litchfieldite (2 figures) 252
" 8—SHERZER: The Genus *Chonophyllum* (7 figures) 282
" 9—KEYES: The Principal Mississippian Section 283
" 10—HALL and SARDESON: Map and Profile of southeastern Minnesota .. 331
" 11 " Paleozoic Rocks of Minnesota (2 figures) 368
" 12 " Thin Sections of Minnesota Paleozoic Rocks (6 figures) 368
" 13—MILLS: Sketch Map of pre-Mesozoic and Mesozoic Rocks 413
" 14—HOBBS: Secondary Banding in Gneiss 460
" 15—COLE: *Paleaster eucharis*, Hall 513
" 16—DALE: Map of the Vermont Valley 514

						Page
Proceedings (Washington):	Figure	1	—*Scolithus shepardi*			32
"	"	"	2	"	*verticalis*	33
"	"	"	3	"	*linearis*	34
"	"	"	4	"	"	34
"	"	"	5	"	*clintonensis*	35
"	"	"	6	"	*linearis*	36
"	"	"	7—*Planolites annularius*			36
"	"	"	8—*Scolithus canadensis*			37
"	"	"	9	"	*minutus*	38
"	"	"	10	"	"	38
"	"	"	11	"	*tuberosus*	39
"	"	"	12	"	*woodi*	39
"	"	"	13	"	"	40
"	"	"	14—*Eophyton* (*Scolithus*) *dispar*			41
"	"	"	15—*Scolithus delicatulus*			41
"	"	"	16—Ideal Section showing the Mode of Occurrence of the nodular Ores			46
"	"	"	17—Ideal Section showing the Mode of Occurrence of the laminated Ores			47
"	"	"	18—Sandstone Dike number 1			51
"	"	"	19—Eastern End of Dike number 1			52
"	"	"	20—Dike number 2			53
"	"	"	21	"	"	54
"	"	"	22—General View of Dike number 2			55
"	"	"	23—The Development of the belemnitic Fauna at the End of the Jurassic and the Beginning of the Cretaceous			62
"	"	"	24—Section through Manzati Valley			82
"	"	"	25—Sketch Map of Missouri			109
"	"	"	26—Ideal Section through the Ozark Uplift			111
"	"	"	27—Ideal Section of the Coal Measures of Missouri and Iowa			115
"	"	"	28—Ideal Section of the Coal Measures of Missouri and Iowa restored to horizontal Attitude			116
"	"	"	29—Ideal Representation of the Beginning of Coal Measure Deposition			116
"	"	"	30—Ideal Representation of a complete Cycle of Deposition of Coal Measures, and of their Mode of Accumulation			117
"	"	"	31—Ideal Illustration of the Accumulation of the Coal Measures			119
"	"	"	32—Ideal Representation of the Missouri Coal Measures			119

WALCOTT: Figure 1—Diagramatic Section of the Canyon City Silurian (Ordovician) Rocks 154

Page

BAYLEY: Figure 1—Map showing Distribution of Eleolite-Syenite in the Towns of Litchfield and West Gardiner, Maine 243
" " 2—Occurrence of Nepheline and Sodalite in Feldspar..... 248
" " 3—Eleolite-Syenite from Red Hill..... 248

WEED: Figure 1—Sketch Map of Montana showing Location of Coal Fields.. 302
" " 2—Section at Belt Butte..... 306
" " 3 " on Belt Creek..... 307
" " 4 " " Sand Coulée..... 313
" " 5 " at Sandcoulée..... 314
" " 6—Sections revealed by Drilling at Sandcoulée..... 315
" " 7—Section of Sandcoulée Coal Seam..... 316
" " 8 " near Belt Creek..... 319
" " 9 " in Belt Field..... 319
" " 10—Sections of Coal Seams of the Great Falls Field..... 320
" " 11—Section at Watson Mine..... 321
" " 12 " " Armington..... 321
" " 13—Coal Seams of Red Lodge Mines..... 327

HALL and SARDESON: Figure 1—Fault in the Magnesian near Hastings, Minnesota..... 344
" " 2—Unconformity of the Saint Peter on the Magnesian and the Conformity of the Trenton on the Saint Peter..... 353
" " 3—Minor Faults and Color Markings of the Saint Peter Sandstone at south Saint Paul..... 354
" " 4—Diagramatic Sketch showing the Relations of the Magnesian, Saint Peter and Trenton... 355
" " 5—Classification of the Lower Silurian..... 359
" " 6—Lenticular Segregations of Fossils in the Blue Limestone, Minneapolis..... 360
" " 7—Lenticular Segregations of Fossils in the *Stictopora* Bed, Saint Paul..... 362

DILLER: Figure 1—General Section through the Taylorville Region..... 377
" " 2—Section of Genesee Valley near Robinson's..... 378
" " 3—Jura-Trias Unconformity..... 380
" " 4—Section on northeastern Slope of Grizzly Mountain..... 381
" " 5—Eastern Slope of Mount Jura..... 385
" " 6—Section through Mount Jura..... 385
" " 7 " near Indian village..... 385
" " 8 " " Donnerwirth's..... 385
" " 9—Northeastern Slope of Grizzly Mountain..... 390

Proceedings (Columbus): Figure 1—Section near Great Barrington..... 461
" " " 2 " " " " 461
" " " 3—Cleavage and Bedding near Great Barrington..... 462
" " " 4—Structure of Hopkins-Searles Quarry.... 462
" " " 5—Section through Rutland-Danby Ridge... 516
" " " 6—Structure of *Hyolithes* Limestone..... 517
" " " 7—General Section on the 103d Meridian... 521

(17 *plates*, 72 *figures*.)

PUBLICATIONS OF THE GEOLOGICAL SOCIETY OF AMERICA.

Regular Publications.

The Society issues a single serial publication entitled Bulletin of the Geological Society of America. This serial is made up of *proceedings* and *memoirs*, the former embracing the records of meetings, with abstracts and short papers, lists of Fellows, etc., and the latter embracing the larger papers accepted for publication. The matter is issued, soon as possible after acceptance, in covered brochures, which are at once distributed to Fellows and exchanges. The brochures are arranged for binding in annual volumes, which are elaborately indexed.

The Bulletin is sold to Fellows and the public either in full volumes or in separate brochures. The volume prices are, to Fellows a variable amount depending on the cost of publication; and to libraries and the public the fixed amounts given below. The brochure prices for volumes 1 and 2 are given on pages ix–xi of volume 2; the prices for the brochures of volume 3 are given below.

Volume 1, covering the work of the Society from the organization in 1888 to the end of 1889, comprises 593 + xii pages, 13 plates and 51 cuts. Price to Fellows, $4.50; to libraries, $5.00; to the public, $10.00.

Volume 2, covering the work of the Society for 1890, comprises 662 + xiv pages, 23 plates and 63 cuts. Price to Fellows, $4.50; to libraries, $5.00; to the public, $10.00.

Volume 3, covering the work of the Society for 1891, is now complete, and comprises 541 + xii pages, 17 plates and 72 figures. Price to Fellows. $4.00; to libraries, $5.00; to the public, $10.00. The volume is made up of 15 brochures as follows:

Brochure.	Pages.	Plates.	Figures.	Price to Fellows.	Price to the Public.
Proceedings of the Summer Meeting held at Washington. H. L. Fairchild, *Secretary*	1–152	0–2	1–32	$1.90	$3.75
Preliminary Notes on the Discovery of a vertebrate Fauna in Silurian (Ordovician) Strata. C. D. Walcott	153–172	3–5	1	.30	.60
Certain extra-morainic Drift Phenomena of New Jersey; On the northward and eastward Extension of the pre-Pleistocene Gravels of the Mississippi Basin. R. D. Salisbury	173–186	.....	.....	.15	.25
The Mannington Oil Field and the History of its Development; Fossil Plants from the Permian Beds of Texas. I. C. White	187–218	6	.....	.40	.75
Notes on the Geology of the Valley of the middle Rio Grande. E. T. Dumble	219–230	.....	.....	.10	.20
Eleolite-Syenite of Litchfield, Maine, and Hawes' Hornblende-Syenite from Red Hill, New Hampshire. W. S. Bayley	231–252	7	1–3	.30	.55

Brochure.	Pages.	Plates.	Figures.	Price to Fellows.	Price to the Public.
A Revision and Monograph of the Genus *Chonophyllum*. W. H. Sherzer	253–282	8	.....	.35	.70
The principal Mississippian Section. C. R. Keyes	283–300	9	.....	.20	.40
Two Montana Coal Fields. W. H. Weed	301–330	.....	1–13	.35	.70
Paleozoic Formations of southeastern Minnesota. C. W. Hall and F. W. Sardeson	331–368	10–12	1–7	.50	1.00
Geology of the Taylorville Region of California. J. S. Diller	369–394	.....	1–9	.30	.55
Jura and Trias at Taylorville, California. Alpheus Hyatt	395–412	.....	.....	.15	.30
Stratigraphy and Succession of the Rocks of the Sierra Nevada of California. J. E. Mills	413–444	13	.....	.30	.60
The Geology of the Crazy Mountains, Montana. J. E. Wolff	445–452	.....	.....	.10	.15
Proceedings of the Fourth Annual Meeting, held at Columbus. H. L. Fairchild, *Secretary*	453–541 i–xii	14–16	1–7	1.15	2.25

Irregular Publications.

In the interests of exact bibliography, the Society takes cognizance of all publications issued either wholly or in part under its auspices. Each author of a memoir receives 30 copies without cost, and is authorized to order any additional number at a slight advance on cost of paper and presswork; and these separate brochures are identical with those of the editions issued and distributed by the Society. Contributors to the Proceedings also are authorized to order any number of separate copies at a slight advance on cost of paper and presswork; but such separates are bibliographically distinct from the brochures issued by the Society.

The following separates of parts of volume 3 have been issued:

Editions uniform with the Brochures of the Bulletin.

Pages 153–172, plates	3, 5—130	copies.	March	15, 1892.
" 173–186,	130	"	"	31, "
" 187–218, plate	6—330	"	April	15, "
" 219–230,	130	"	"	22, "
" 231–252, plate	7—230	"	June	4, "
" 253–282, "	8— 30	"	May	24, "
" 283–300, "	9— 30	"	June	3, "
" 301–330,	30	"	"	26, "
" 331–368, plates	10, 12—130	"	"	23, "
" 369–394,	230	"	July	15, "
" 395–412,	280	"	"	15, "
" 413–444, plate	13—100	"	August	8, "
" 445–452,	30	"	"	8, "

*Special Editions.**

Pages	3–13†, frontispiece	100	copies.	March	25,	1892.	With covers.‡	
"	14– 15,	30	"	November	30,	1891.	Without covers.	
Page	15,	30	"	"	30,	"	"	"
Pages	16– 22,	100	"	March	19,	1892.	"	"
"	23– 31,	100	"	January	22,	"	"	"
"	32– 44,	50	"	"	22,	"	"	"
"	44– 50, plate	1—100	"	March	24,	"	With	"
"	50– 55,	100	"	"	19,	"	Without	"
"	56– 59,	100	"	"	25,	"	With	"§
"	59– 60,	30	"	"	19,	"	Without	"
"	61– 64,	30	"	"	19,	"	"	"
"	65– 68, plate	2—100	"	"	24,	"	With	"
"	68– 79,	30	"	"	19,	"	Without	"
Page	80,	30	"	"	19,	"	"	"
Pages	80– 81,	30	"	"	19,	"	"	"
"	81– 83,	200	"	"	19,	"	With	"
"	83– 84,	30	"	"	19,	"	Without	"
"	85–100,	300	"	February	26,	"	With	"
"	101–109,	100	"	March	19,	"	Without	"
"	109–121,	200	"	"	19,	"	With	"
"	121–123,	30	"	"	19,	"	Without	"
"	124–127,	200	"	"	19,	"	"	"
"	128–132,	30	"	"	19,	"	"	"
"	134–148,	30	"	"	19,	"	"	"
"	148–149,	30	"	"	19,	"	"	"
"	150–151,	30	"	"	19,	"	"	"
"	455–458,	100	"	November	18,	"	With	"
"	460–464, plate	14—150	"	"	18,	"	"	"
Page	464,	30	"	"	15,	"	Without	"
Pages	470–483,	30	"	"	15,	"	"	"
"	483–484,	30	"	"	15,	"	"	"
"	484–487,	30	"	"	15,	"	"	"
"	488–495,	200	"	"	15,	"	"	"
"	495–496,	30	"	"	15,	"	"	"
"	496–500,	150	"	"	15,	"	"	"
"	501–504,	30	"	"	15,	"	"	"
"	505–508,	30	"	"	15,	"	"	"
"	508–511,	30	"	"	15,	"	"	"
"	512–514, plate	15—200	"	"	15,	"	"	"
"	514–519, "	16—100	"	"	15,	"	"	"
"	519–521,	100	"	"	15,	"	"	"
"	523–530,	30	"	"	15,	"	"	"
"	viii–ix,	30	"	"	15,	"	"	"

* Bearing the imprint ["FROM BULL. GEOL. SOC. AM., VOL. 3, 1891"].
† Fractional pages sometimes included.
‡ Pages 56–59 inclosed in same cover.
§ With pages 3–13 and frontispiece.

Reprints.

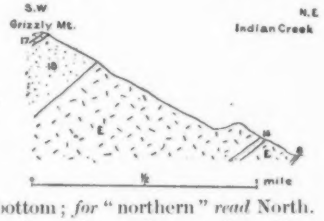
The matter published by the Society is occasionally reprinted, sometimes in part only, sometimes in extended or otherwise modified form, and incidental cognizance is taken of such reprints. The following reprint has been noted:

Volume 3, pages 283–300, plate 9: Reprinted with some additional matter under the title—The | Classification | of the | Lower Carboniferous | Rocks | of the | Mississippi Valley || A Dissertation | presented to the Board of University Studies of the Johns | Hopkins University for the Degree of Doctor | of Phiosophy || By | Charles Rollin Keyes. | 1892. | ——— | Washington: | Judd & Detweiler, Printers | 1892.

ERRATA.

Page	10,	line	15	from bottom;	*for*	"reënfore"	*read*	reënforce.
	101,	"	13	"	"	"aquatic"	"	agnostic.
	103,	"	6	"	"	"*Karstein*"	"	*Karsteni.*
	105,	"	12	" top	"	"twinned"	"	tumid.
	105,	"	14	" "	"	"ths"	"	the.
	106,	"	1	" "	"	"Centra"	"	Central.
	106,	"	3	" bottom	"	"probabilitles"	"	probabilities.
	107,	"	27	" "	"	"*Asterostoma*, n. sp."	"	*Archæopreuster abruptus*, Greg.
	107,	"	18	" "	"	"*Asterostoma*"	"	*Archæopreuster.*
	154,	in cut;			"	"Freemont"	"	Fremont.
	233,	"	"		"	"Sawyer"	"	Sawyer's farm.
	233,	"	"		"	"Spaulding Sch."	"	Spaulding's farm.
	369,	line	4	from bottom;	"	"Northern"	"	North.
	373,	"	4	" top	"	"northern"	"	North.
	373,	"	11	" "	"	"tufaceous"	"	tuffaceous.
	373,	"	9	" bottom	"	"Trias"	"	Lias.
	375,	"	4	" top	"	"tufaceous"	"	tuffaceous.
	378,	"	14	" bottom;	*after* "*Section*"	*insert*		*on northern side.*
	378,	"	6–4	" "	*for* "tufaceous"	*read*		tuffaceous.
	380,	"	16	" "	*after* "*Unconformity*"	*insert*		*on southwestern Branch of Peters Ravine.*
	381,	in cut;			*to left of* "N. E."	*insert*		GENESEE.
	381,	line	15	from bottom;	*after* "*Mountain*"	"		*through Genesee.*
	389,	"	1	" top;	*for* "*Northern*"	*read*		*North.*
	389,	"	5	" "	" "northern"	"		North.

390; *for defective cut substitute*



391,	line		7	from bottom;	*for*	"northern"	*read*	North.
392,	lines	23, 20, 17, 11		"	"	"	"	"
393,	line		8	" top	"	"	"	"

INDEX TO VOLUME 3.

Page

ADIRONDACKS, Pleistocene shores on the..... 488
AGASSIZ, A., Cited on echinoids..... 104, 105
ALABAMA, Asphalt in..... 188
—, Middleton formation of..... 511
ALASKA, Geology of..... 495, 496
—, Glaciers of..... 139
ALECTRYONIA, New species of..... 404
ALGONKIAN rocks of Minnesota..... 335
— —, Relations of Silurian to..... 155
ALGONQUIN lake..... 484
ALLEN, COLONEL, Cited on natural gas..... 207
ALLEN, J., Exploration by, cited..... 333
ALLPORT, SAMUEL, Cited on thermometamorphism..... 16
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Reprint from proceedings of the..... 215
AMERICAN MANUFACTURER, Reprint from the..... 204
AMI, H. M., Cited on *Scolithus*..... 41
AMMONITES *colfaxii*, Significance of..... 436
AMUCACEOUS, Definition of term..... 132
ANALYSIS of coal..... 317
— — eleolite-syenite..... 242
— — hornblende-syenite..... 249
— — magnesian limestone..... 348
— — Potsdam sandstone..... 339
— — Trenton limestone..... 358
ANDREWS, E. B., Cited on the origin of petroleum..... 193
ANOMIA, New species of..... 401
ANTICLINAL structure of northern California. 388
— theory, Development of the..... 193
— — (The criticisms of the) of natural gas; I. C. White..... 215
— — (The) of natural gas; I. C. White..... 204
ARCESTES *californiensis*, Naming of species... 398
ARCHEAN of the Sierra Nevada..... 424
ARIZONA, Triassic of..... 25
ARKANSAS, Eleolite-syenite of..... 83
—, Iron ores of..... 44
ARLINGTON beds, Description of..... 375
ARMINGTON, Section at..... 321
ARNIOCERAS *woodhulli*, Naming of species..... 411
ARTESIAN wells, A source of supply for..... 124
ASHBURNER, C. A., Cited on California geology. 370
—, Criticism of "anticlinal theory" by... 206, 215
ASTRASPIS *desiderata*, Founding of species..... 166
AUDITING COMMITTEE, Report of..... 470
AUX VASES sandstone, Definition of..... 295

BALDWIN, PRENTISS, Collection by..... 505
BARROIS, CH., Cited on thermometamorphism..... 16
BASHFORD, ——, Record of address by..... 465
BASSETT, MARY E., Analysis by..... 348
BAYLE, ÉMILE, Cited on the Jura of South America..... 409
BAYLEY, W. S., Eleolite-syenite of Litchfield, Maine, and Hawes' hornblende-syenite from Red Hill, New Hampshire..... 231
—, Record of discussion by..... 84
—, Title of paper by..... 511
BEAR creek mines..... 328
BECK, T. R., Cited on thermometamorphism. 16
BECKER, G. F., Cited on the Cretaceous of California..... 425, 438
— — — deformation of the Sierra Nevada.... 419
— — — post-Triassic epeirogeny..... 382

Page

BECKER, G. F., Cited on the geology of California..... 414
— — — vulcanism in California..... 394
BEECH, W. A., Analysis by..... 358
BELEMNITES, Development of the..... 62
—, New species of..... 405
BELL, ROBERT, Cited on Pleistocene submergence..... 509
BELT butte, Section of..... 306
— creek mines..... 318
— —, Section of..... 307
BELT, THOMAS, Cited on Pleistocene submergence..... 510
BIBLIOGRAPHY of J. Francis Williams..... 458
BICKNELL sandstone, Description of..... 373, 406
— tuff, Description of..... 407
BIG BONE cave, Fossils from..... 121
"BIG INJUN" sand, Oil from the..... 188
BILLINGS, E., Cited on Cambrian fossils..... 516
— — — Paleozoic corals..... 256
— — — *Scolithus*..... 37
BIOLOGICAL SOCIETY OF WASHINGTON, Notice read before the..... 155
BLACK EAGLE falls, Section at..... 311
"BLACK EARTH" (The) of the steppes of southern Russia; A. N. Krassnof..... 68
BLAKE, W. P., Cited on faulting in the Sierra Nevada..... 438
— — — granite in the Sierra Nevada..... 424
BLANCHARD, MISS M. L., Analysis by..... 358
BLUE limestone, Description of..... 360
BOHEMIA, Fossil coral from..... 275
BONES, Fossil, from Tennessee..... 121
BOONVILLE, Pleistocene terraces at..... 491
BORING (A deep) in the Pleistocene near Akron, Ohio; E. W. Claypole..... 150
BOWMAN, AMOS, Cited on the Sierra Nevada... 416
BRACKETT, R. N., Reference to, as joint author..... 457
BRAINERD, EZRA, Acknowledgment to..... 38
— —, Quoted on *Scolithus*..... 42
BRANNER, J. C., Reference to, as state geologist..... 457
BRAVAIS, AUGUSTE, Cited on changes of level. 65
BREWER, W. H., Cited on California geology. 370
BRIDGES, Natural, of Florida..... 132
BROADHEAD, G. C., Acknowledgments to..... 272
—, Cited on deformation..... 110, 112, 114
— — — Kinderhook beds..... 289
—, Discussion of "black earth" by..... 80
BRÖGGER, W. C., Cited on eleolite-syenite..... 237
BRONGNIART, L., Cited on Triassic plants..... 24
BUFF limestone, Description of..... 360
BULLETIN, Cost of..... 469
—, Distribution of..... 467
BUNBURY, SIR CHARLES J. F., Cited on Triassic plants..... 24
BURLINGTON limestone, Definition of..... 292
—, Section at..... 285
BURRILL, H. H., Acknowledgments to..... 314
BUVIGNIER, A., Cited on the genus *Opis*..... 403
BY-LAWS, Proposed amendment to..... 370

CADELL, H. M., Title of paper by..... 55
CALIFORNIA, Cienegas of..... 124
—, Geology of Taylorville..... 369
—, Jura and Trias at Taylorville..... 395
—, Peculiar deposits in..... 133

Page

California, Rocks of the Sierra Nevada in.. 413
Calvin, Samuel, Cited on Iowa stratigraphy. 288
Camarella bed, Description of..... 364
Cambrian formations of Minnesota..... 332, 464
— rocks of the Green mountains 514
Canada, Drift of 142
—, Fossil coral from..... 267
—, Glacial lakes of..... 485
Canyon city, Paleozoic fossils from..... 153
Carboniferous faunas 102
— (Permian) fossils 217
— of Alaska 405
— — California..... 372
— — Missouri 109
— — Montana 308
— — South America 14
— — the East Indies..... 15
— rocks, Oil from..... 188
— —, Section of..... 283
Carel, H. C., Analysis by..... 348
Carll, J. F., Cited on natural gas 213
—, Criticisms of "anticlinal theory" by..... 215
Carnegie, Andrew, Cited on natural gas 204
Carpenter, F. R., Analysis by..... 54
—, Cited on Silurian fossils..... 163
Carver, Jonathan, Reference to travels of... 333
Chamberlain, T. C., Cited on distribution of bowlders 233
— — — drift..... 135, 144
— — — extra-morainic drift..... 174
— — — glacial episodes..... 181
— — — kames 145
— — — Paleozoic unconformities..... 353
— — — rock structure 343
— — — *Scolithus*..... 40
— — — supposed Huronian rocks..... 335
— — — Tertiary gravels..... 183
— — — the driftless area of southeastern Minnesota..... 332
—, Election of, as Vice-President..... 454
—, Finding of Saint Peter fossils by..... 352
—, Record of discussion by..... 68, 81, 134
—, Title of paper by..... 133
Champlain (The) submergence; Warren Upham 508
— valley, Glacial lakes of the..... 486
Chance, H. M., Cited on natural gas..... 208
—, Criticisms of "anticlinal theory" by..... 215
Chaney, L. W., Cited on *Cryptozoon*..... 244
Channels over divides not evidence per se of glacial lakes; J. W. Spencer..... 491
Chapin, F. H., Donation of photographs by... 477
Chapman, E. J., Cited on glacial lakes 484
Chapple, C. S., Analysis by 348
Chattahoochee embayment (The); L. C. Johnson..... 128
Chemnitzia, New species of..... 407
Chernozem, Definition of..... 68
Chester beds, Definition of..... 295
—, Section at 287
Chonophyllum *greeni*, Founding of species... 275
— *pseudohelianthoides*, Founding of species.. 275
— (A revision and monograph of the genus); W. H. Sherzer..... 253
Chouteau limestone, Definition of..... 288
Cidaris, New species of..... 402
Cienagas, Definition of..... 124
— (The) of southern California; E. W. Hilgard..... 124
Cincinnati group, Description of..... 365
Clark, W., Title of paper by..... 500
Clark, W. B., Cited on echinoids..... 103
Clarke, F. W., Acknowledgments to..... 233
—, Analysis of eleolite-syenite by..... 234
—, Cited on eleolite-syenite..... 236
Claremont, Rocks of..... 422
Claypole, E. W.; A Deep Boring in the Pleistocene near Akron, Ohio 150
—, Cited on glacial lakes..... 484
— — — *Megalonyx*..... 122
— — — Silurian fish remains..... 165

Page

Claypole, E. W.; Discussion of fossil plants from Texas by..... 459
— — — isostasy by..... 503
— — — Silurian fish remains by 168
—, Record of discussion by.... 25, 44, 133, 459, 460
—, Title of paper by..... 500, 504
Clough, R. G., Acknowledgments to 232
Coal, Analyses of..... 317
— fields, Montana..... 301
Coal Measures of Missouri..... 109
— — the Mississippi valley..... 297
Coal series of Texas, Description of the..... 225
Cocker, H. R., Acknowledgments to..... 314
Cole, A. H.; *Palæaster eucharis*, Hall 512
Colorado, Silurian vertebrates from..... 153
—, Triassic of..... 25
Columbia formation, Continental oscillations represented by..... 502
— — in Texas..... 230, 483
Columbian University, Meeting in..... 2
Columbus meeting, Proceedings of..... 453
— —, Register of..... 522
Committee on photographs, Report of..... 470
—, Report of auditing 470
Comstock, T. B., Cited on Cretaceous of Texas. 224
—, Title of paper by..... 124
Connecticut, Triassic of..... 25
Conophyllum, Relations of 267
Constitution, Failure of proposed amendment to. 455
Convent Hill, Section at..... 226
Cook, G. H., Cited on Yellow gravel..... 182
—, Reference to work of 173
Cope, E. D., Cited on deformation in Texas..... 94
— — — geology of Texas..... 230
— — — Permian fossils..... 459
—, Discussion of Silurian fish remains by... 168
—, Record of discussion by..... 14, 23, 83, 123
Coquand, Henri, Cited on the Jura of North America..... 409
Corals, Paleozoic 253
Correlation of East Indian formations..... 15
— — South American deposits 14
— — the Jura-Trias..... 23
Cotteau, Gustave, Cited on Echinoids..... 103
Council, Report of the..... 466
Cow creek, Section on..... 223
Crandall, A. R., Cited on trap dikes 50
Crazy mountains (The geology of the), Montana; J. E. Wolff..... 445
Cretaceous beds, Early..... 61
— deposits of Texas..... 85, 220
— echinoids..... 103
— of California..... 425
— — Montana..... 310, 446
— — Nebraska 52
— — South America..... 13
— — the plains..... 519
Crosby, W. O., Cited on hornblende-syenite. 243
Cross, J. G., Analysis by..... 348
Cross, Whitman, Cited on volcanic rocks..... 17
Crosskey, H. W., Cited on altitudes..... 506
Crossman, J. H., Dedication of species to..... 411
Ctenostreon, New species of..... 402, 405
Culver, G. E., Collaboration by 51
Cummins, W. F., Collection by..... 217
Curtice cliff, Naming of. 396
Curtice, Cooper, Cited on California geology. 371
—, Collections by..... 396
—, Dedication of species to 408
Curtiss, L. R., Cited on natural gas..... 209
Cushing, H. P., Cited on Alaskan glaciers.... 507
—, Publication of photograph by..... 478
—, Record of discussion by..... 56
Cyathophyllum, Discussion of genus 279

Dakota, Geology of..... 519
— rocks in Montana..... 310
Dale, T. N., Cited on mount Greylock..... 461

Page

Dale, T. N.; On the structure and age of the Stockbridge limestone in the Vermont valley ... 514
—, Quotations from, on rocks of Great Barrington ... 462
Dall, W. H., Identification of species by ... 498
Dames, Wilhelm, Cited on *Scolithus* ... 40
Dana, J. D., Cited on *Chanophyllum* ... 281
— — — climate ... 73
— — — drift ... 135
— — — geology of Massachusetts ... 460
— — — *Scolithus* ... 38
— — — Triassic deposits ... 25
— — — Wing's work ... 518
Daonella bed, Description of ... 397
— *tenuistriata*, Naming of species ... 397
Davis, W. J., Cited on Paleozoic corals ... 267
Davis, W. M., Cited on dip plains ... 85
— — — Montana stratigraphy ... 303
— — — Pleistocene terraces ... 487
—, Explanation of photographs by ... 474, 475, 476
—, On committee on photographs ... 470
Dawson, G. M., Cited on bowlders ... 145
— — — drift ... 142
— — — post-Triassic epeirogeny ... 382
— — — the Kootanie formation ... 322
— — — — Trias of British Columbia ... 379
— — — Vulcanism in California ... 376
—, Photographs by ... 481
Dawson, Sir J. William, Election of, as vice-president ... 454
Deformation of California rocks ... 378
— — southeastern United States ... 502
— in Missouri ... 110
— — Texas and New Mexico ... 85
— — the Green mountains ... 516
— — — Sierra Nevada ... 416
—, Pleistocene ... 65, 508
Del Rio, Geology about ... 220
Denton, A. J., Collection of fossils by ... 121
Deposition of Missouri Coal Measures ... 109
Derby, O. A., Title of paper by ... 133
Desor, E., Cited on echinoids ... 105
Devonian fauna of Bolivia ... 13
— fossil ... 512
— rocks of Minnesota ... 332, 367
Dictyorhabdus *priscus*, Founding of genus and species ... 165
Dikes, Sandstone ... 50
Diller, J. S., Acknowledgments to ... 233, 396
—, Cited on California structure ... 383
— — — geology of Lassen peak ... 415
— — — hornblende-syenite ... 243
— — — sandstone dikes ... 51
— — — sodalite ... 240
—, Collections by ... 396
—, Election of, on auditing committee ... 454
—, Geologic names by ... 412
—; Geology of the Taylorville region of California ... 369
—, Letter from, on California peridotites ... 432
—, Reading of paper by ... 460, 511
—, Record of discussion by ... 460, 495, 511
— — — report of, for committee on photographs ... 458
—, Reference to studies of ... 403, 407
—, Report of, for committee on photographs ... 470
—, Titles of papers by ... 460
Dinotherium (On the existence of the) in Roumania; G. Stefanescu ... 81
Distribution (Inequality of) of the englacial drift; Warren Upham ... 134
Dodge, J. A., Analyses by ... 258, 348
—, Cited on the Saint Peter sandstone ... 351
Dokuchaef, ——, Cited on "Black Earth" ... 69
Dowling, D. B., Photographs by ... 482
Drift, englacial ... 134
— phenomena (Certain extra-morainic) of New Jersey; R. D. Salisbury ... 173
Drought and winds (Effects of) on alluvial deposits in New England; H. T. Fuller ... 148

Page

Dumble, E. T., Acknowledgment to ... 217
—, Discussion of fossil plants from Texas by ... 459
—, Donation of photographs by ... 472
—; Notes on the geology of the valley of the Middle Rio Grande ... 219
—, Title of paper by ... 483
Dumont, André, Cited on geology of Roumania ... 81
Dutton, C. E., Cited on term isostasy ... 501
Dybowski, W., Cited on Paleozoic corals ... 256
Dyer, C. B., Quoted on *Scolithus* ... 38

Eagle Pass division, Description of the ... 224
— —, Geology about ... 220
— —, Section near ... 225, 227
Eakins, L. G., Acknowledgments to ... 233
—, Analysis of eleolite-syenite by ... 241
Earseman, W., Cited on natural gas ... 204
— — — the origin of petroleum ... 193
East Pitcairn, Pleistocene shore lines near ... 489
Echinanthus *quinqueferia* redefined ... 105
Echinoderms, Distribution of ... 101
Edwards, J. Milne, Cited on Paleozoic corals ... 255
Ehrenberg, C. G., Cited on Paleozoic corals ... 254
Eichwald, Eduard von, Cited on fish remains ... 59
Eldridge, G. H., Cited on Montana rocks ... 302
— — — the Harding sandstone ... 164
Election of Fellows ... 2
— — Officers and Fellows ... 454
Eleolite-syenite of Litchfield, Maine, and Hawes' Hornblende-syenite from Red Hill, New Hampshire; W. S. Bayley ... 231
— (The) of Beemerville, New Jersey; J. F. Kemp ... 83
Elliot, H. R., Quoted on geology of Alaska ... 497
Ells, R. W., Photographs by ... 483
Elm creek, Section on ... 226
Emerson, B. K., Cited on eleolite-syenite ... 84
—, Discussion of isostasy by ... 504
— — — Stockbridge limestone by ... 583
—, Record of discussion by ... 495, 511
—, Resolution of thanks by ... 522
Emmons, S. F., Cited on Paleozoic fossils ... 153
Engelmann, G., Cited on prairies ... 73
England, Fossil coral from ... 264
—, Shell beds in ... 505
Entolium *costatum*, Naming of species ... 407
— *meeki*, Naming of species ... 402
Eocene deposits of Gulf slope ... 128
— — — the Plains ... 519
— — — Texas ... 85
— echinoid faunas ... 104
— iron ores ... 45
—, Middleton formation of the ... 511
Equus beds of the Plains ... 519
Eriptychius *americanus*, Founding of species ... 167
Eruptive rocks of Alaska ... 496
— — — California ... 376, 421
— — — Montana ... 449
Escondido beds, Description of ... 227
Etheridge, Robert, Jr., Cited on the Jurassic of Australasia ... 409
Eurypterus beds (The) of Oesel compared with those of North America; Friedrich Schmidt ... 59
Evolution, Syllabus of lectures on ... 7

Fairbanks, H. W., Cited on California unconformities ... 383
Fairchild, H. L., Donation of photographs by ... 372
—, Election of, as Secretary ... 454
—; Proceedings of the Fourth Annual Meeting, held at Columbus, Ohio, December 29, 30 and 31, 1891 ... 453
— — — — Summer Meeting, held at Washington, August 24 and 25, 1891 ... 1
Fairview, Section at ... 191
Faulting in California rocks ... 387
— — Green mountains ... 517

Page

Fauna, Jurassic and Cretaceous 61
— (Preliminary notes on the discovery of a vertebrate) in Silurian (Ordovician) strata; C. D. Walcott 153
Faunas (The relations of the American and European echinoid); J. W. Gregory 101
Faxon, Walter, Cited on Jurassic fossils..... 402
Feather river district, Rocks of 421
Featherstonhaugh, G. W., Exploration by, cited 333
Fellows, Election of 2, 455
—, List of 524
Fish remains, Silurian 153
Fleming, Sandford, Cited on glacial lakes..... 484
Florida, Formations of 128
Foerste, A. F., Cited on Cambrian fossils..... 517
Fontaine, W. M., Cited on California fossil plants 389
— — — fossil plants from Montana 323
— — — Permian fossils 217
— — — Triassic plants 24
—, Fossil determinations by 374
—, Quotation from, on Permian flora 218
Foreman beds, Description of 373
Fossil bones from Tennessee 121
—, Devonian 512
— horizons in California 439
— plants from Montana 223
— — — the Wichita or Permian beds of Texas; L. C. White 217
Fossils, Alaskan 498
—, Cambrian 516
—, Carboniferous 399
—, Echinoid 101
—, Jurassic 428
—, Jurassic and Cretaceous 61
—, List of Carboniferous 375
— — — Permian 218
— — — Silurian 158
—, Lower Silurian 360
—, Mesozoic 15, 24, 62, 397
—, Miocene 93
— of Roumania 81
— — the Blue limestone 361
— — — Buff limestone 360
— — — Potsdam sandstone 340
—, Paleozoic 32
—, Pleistocene 67, 505
—, Revision of Paleozoic 253
—, Silurian 69, 376
—, Triassic 23
—, Vertebrate 121
Fremont limestone, Definition of 154
Fucoid bed, Description of 363
Fuller, H. T.: Effects of droughts and winds on alluvial deposits in New England 148

Gabb, W. M., Cited on California fossils..... 397, 414, 436, 438
Garber, John, Acknowledgment to 189
Gas, Pressure of natural 214
Geer, Gerard de, Cited on Pleistocene submergence 510
— — — terraces 487
—; Quaternary changes of level in Scandinavia 65
Geikie, A., Cited on overthrust faults..... 393
—, Quoted on quartz grains 351
Gemmellaro, G. G., Cited on Sicilian paleontology 15
Genus, Description of 165
—, Naming of new 398
—, Revision of 253
Gervillia *gigantea*, Naming of species..... 402
— *linearis*, Naming of species 402
—, New species of 405
Gibbs, George, Cited on zircons 254
Gilbert, G. K., Addresses by 2
—, Cited on deformation 66
— — — drift 142

Page

Gilbert, G. K., Cited on glacial lakes..... 484, 491
— — — Iroquois shores 495
— — — Pleistocene beaches 486, 488
— — — the Henry mountains 448
—, Discussion of Iroquois shores by 492
— — — isostasy by 503
—, Election of, as President 454
—, Record of discussion by 31, 67, 459, 460, 465, 495, 504
— — — remarks by 522
Glacial action, Discussion of 179
— deposits 134, 505
— — of South America 14
— lakes, Channels not evidence of 491
— — Warren, Algonquin, Iroquois and Hudson-Champlain (Relationship of the); Warren Upham 484
Glaciation in Montana 446
Glaciers of Alaska 496
— — Greenland, Condition of 138
Glyphæa *punctata*, Naming of species 402
Gneiss (Secondary banding in); W. H. Hobbs. 460
Goeppert, H., Cited on *Scolithus* 34
Goldfuss, G. A., Cited on Paleozoic corals.... 254
Gold of the Sierra Nevada 441
Goniomya, New species of 402
Goodchild, J. G., Cited on Pleistocene submergence 510
Gottsche, C. M., Cited on the Jura of South America 409
Grammoceras, New species of 405
Grandeau, Louis, Cited on calcareous soils.. 80
Gravels (On the northward and eastern extension of the pre-Pleistocene) of the Mississippi basin; R. D. Salisbury 183
Great Barrington, Geology of 462
Great Falls coal field 391
— formation, Age of 322
Great Plains (A contribution to the geology of the); Robert Hay 519
Greene, G. K., Dedication of species to..... 274
Greenland, Glaciers of 139
Gregory, J. W.: The relations of the American and European echinoid faunas 101
Greylock (Mount), Geology of 461
Grizzly quartzite, Description of 376
Glyphæa *bononiformis*, Naming of species... 407
— *curtici*, Naming of species 408
Guffey, J. M., Acknowledgments to 195, 211
Gulf of Mexico (The) as a measure of isostasy; W J McGee 501

Hager, A. D., Cited on Cambrian rocks..... 515
Haime, Jules, Cited on Paleozoic corals..... 254
Haldemann, S. S., Quoted on *Scolithus*..... 32
Hall, C. W., and F. W. Sardeson: Paleozoic formations of southeastern Minnesota... 331
—, Cited on the Trenton limestone..... 367
—, Discussion of Paleozoic formations by.... 464
—, Title of paper by 464
Hall, James, Cited on Coal Measures.. 120
— — — Iowa stratigraphy 288
— — — Kaskaskia limestone 297
— — — Paleozoic corals 257
— — — *Scolithus* 33
— — — supposed Huronian rocks 335
— — — Warsaw beds 293
—, Discussion of Silurian fish remains by... 170
—, Founding of Potsdam by, cited 336
—, Letter from, on *Chonophyllum* 281
—, Quoted on *Palæaster eucharis* 512
Halobia bed, Description of 399
Halysites *catenulatus*, Use of in correlation.. 163
Hamilton shale, Definition of 289
Hardsrave sandstone, Description of.... 373, 401
Harding sandstone, Definition of 154
Harker, Alfred: Thermometamorphism in Igneous rocks 16
Harlan, Richard, Cited on *Megalonyx* 123
Harrington, M. W., Acknowledgments to.... 335

Page

HARTT, C. F., Reference to collections by.... 14
HARTZ mine, Section near the.... 225
HAWES, G. W., Cited on elcolite-syenite.... 231
—, Quoted on hornblende-syenite.... 243
HAY, ROBERT; A contribution to the geology of the Great Plains.... 519
—, Cited on Tertiary deposits.... 88
—, Donation of photographs by.... 473
—, Record of discussion by.... 81, 148
—; Sandstone dikes in northwestern Nebraska.... 50
HAYES, C. W., Cited on overthrust faults.... 383
—; Notes on the geology of the Yukon basin. 495
—, Reading of paper by.. 460
—, Record of discussion by.... 460
HEILPRIN, ANGELO, Cited on Eocene mollusca. 47
HEMIENTOLIUM, Naming of genus.... 398
HERRON, C. L., Analysis by.... 348
HICKS, L. E., Cited on sandstone dikes.... 50
HIGHBRIDGE, Extra-morainic drift at.... 178
HILGARD, E. W., Cited on Middleton formation.... 511
—, Discussion of "black earth" by.... 80
—, Record of discussion by.... .... 67, 134
—; The Cienagas of southern California.... 124
—, Title of paper by.. 512
HILL, R. T., Cited on sandstone dikes 55
— — — Texas and Mexico.... 483
—; Notes on the Texas-New Mexican region. 85
—, Record of discussion by.... 14
HILLEBRAND, W. F., Acknowledgments to.... 232
—, Analysis of hornblende-syenite by.... 249
HINCHMAN tuff, Description of.... 275, 407
HITCHCOCK, C. H., Cited on Cambrian rocks.. 515
— — — drift.... 135
— — — *Scolithus*.... 36
—, Record of discussion by 133
—, Work of, in connection with library.... 469
HITCHCOCK, EDWARD, Cited on Cambrian rocks 515
— — — glacial deposits.... 140
— — — *Scolithus*.... 32
HOBBS, W. H., Cited on Cambrian rocks.... 519
—, Donation of photographs by 474
—; Secondary bandings in gneiss.... 460
HOLM, GERHARD, Cited on shore lines.... 67
HOLMES, J. A., Record of discussion by.... 133
HOLST, N. O., Cited on glacial deposits.... 138
— — — sandstone dikes. 55
HORNBLENDE-SYENITE from New Hampshire.. 231
HORTVET, JULIUS, Analysis by.... 351
HOSSELKUS limestone, Description of.... 374, 399
HUDSON-CHAMPLAIN lake.... 484
HUKILL, E. M., Reference to oil well of.... 197
HUNT, T. S., Cited on formation of geodes... 48
— — — *Scolithus*.... 39
— — — the origin of petroleum.. 193
HUTTON, W., Cited on thermometamorphism 16
HYATT, ALPHEUS, Cited on California geology. 371
— — — Jurassic fossils.... 373
— — — the succession of Jurassic rocks 382
— — — — Jura of South America.. 409
— — — — Trias of Taylorville.... 379
—, Discussion of fossil plants from Texas by.... 459
—; Jura and Trias at Taylorville, California.. 395
—, Record of discussion by.... 484
—, Title of paper by.... 460
HYDROCARBONS, Source of 188
HYOLITHES limestone, Structure of.... 517

ICE action, Discussion of.... 179
IDDINGS, J. P., Cited on dikes in the Crazy mountains.... 451
IGNEOUS rocks, thermometamorphism in.... 16
ILLINOIS, Pre-glacial gravels in.... 181
—, Prairies of.... 72
—, Sections in 286
INOCERAMUS bed, Description of the.. 405
— (?) *gervilliioides*, Naming of species.... 398
— (?) *simplex*, Naming of species.... 398

Page

INTERGLACIAL deposits.... 305
IOWA, Coal Measures of.... 115
—, Sections in.... 285
—, Palæozoic formations of.... 464
—, Stratigraphy of northeastern.... 341
IRON ores, Origin of.... 47
— — (The Tertiary) of Arkansas and Texas; R. A. F. Penrose, Jr.... 44
IROQUOIS lake.... 484
— shore (The) north of the Adirondacks; J. W. Spencer.... 488
ISOBASES, Definition of term.... 63
ISOSTASY, Measure of.... 501
IRVING, R. D., Cited on nomenclature.... 464
— — — Potsdam conditions.. 336
— — — supposed Huronian rocks.... 335
—, Tribute to.... 455

JACKSON, A. W., Quoted on Spanish peak granite.... 421
JACKSON, T. M., Line of levels by.... 197
JAEKEL, OTTO, Acknowledgments to.... 165
—, Discussion of Silurian fish remains.... 168
—, Record of discussion by 23
JAMES, JOHN, Acknowledgment to.. 338
JAMES, J. F.; Studies in problematic organisms—the genus *Scolithus*.... 32
JAMES, U. P., Quoted on *Scolithus*.... 40
JOHNSON gravels, Description of.... 372
JOHNSON, L. C., Record of discussion by.... 108
—; The Chattahoochee embayment.... 128
JONES, T. R., Cited on *Scolithus*.... 34
JORDAN sandstone, Definition of.... 342
JUDD, J. W., Cited on thermometamorphism.. 16
JULIEN, A. A., Cited on geology of Massachusetts.... 461
JURA and Trias at Taylorville, California; Alpheus Hyatt. 395
JURASSIC echinoid faunas.... 103
— of California.... 372
— — Montana.... 309
— — the Sierra Nevada.... 425
— (On the Marine beds closing the) and opening the Cretaceous, with the history of their fauna; A. Pavlow.... 61
JURA-TRIAS, Correlation of the.... 23
— of South America.... 13
— — Texas 85
— — the East Indies 14

KANSAS, Geology of 520
—, Prairies of.... 80
KARE, G. J., Resolution of thanks to 522
—, Welcome to the Society by.... 454
KARPINSKI, A., Cited on Russian paleontology 15
KASKASKIA beds, Definition of.... 295
KELLICOTT, D. S., Record of address by.... 465
—, Resolution of thanks to 522
KEMP, J. F., Announcement by.... 22
—; Memorial of John Francis Williams.. .. 455
—, On committee on photographs.... 470
—; The elcolite-syenite of Beemerville, New Jersey.... 83
KENDALL, P. F., Cited on bowlders 506
KENTUCKY, Fossil coral from.... 276
—, Gas wells in.... 188
KEOKUK limestone, Definition of.... 292
—, Section at.... 285
KETLEY, Fossils from 505
KEYES, C. R., Cited on Coal Measures.... 120
— — — Osage limestone.... 291
—; The Principal Mississippian section.... 283
—, Title of paper by.... 133
KINDERHOOK beds, Definition of.... 287
KING, CLARENCE, Cited on California geology.. 370
— — — post-Carboniferous epeirogeny.... 379
KLAMATH mountains, First use of name cited 374
KLAPPER, H. G., Analysis of sandstone by.... 339
KLEIN, CARL, Tribute to.... 456

Page

Knowlton, F. H., Cited on Cretaceous fossil plants 330
— — — fossil plants..... 323
Koninck, L. G. de, Cited on Paleozoic corals.. 255
Kootanie of Montana..... 309
Krapotkin, P., Cited on glacial phenomena.. 70
Krassnof, A. N.; The "black earth" of the steppes of southern Russia..... 68

Laccolites of the Crazy mountains..... 448
Lafayette formation, Continental oscillations represented by..... 502
— — in Texas..... 230, 483
Lakes (Glacial), Evidence of..... 491
Lamplugh, G. W., Cited on glacial phenomena. 507
—, Collections by..... 61
Lane, A. C., Record of discussion by..... 22
Laramie rocks of Montana 446
Las Moras creek, Section on..... 223
Lawson, A. C., Cited on drift 142
Lazenby, W. R., Resolution of thanks to..... 522
Le Conte, Joseph, Record of discussion by... 55
Leidy, Joseph, Cited on *Megalonyx* 122
— — — the geology of Texas..... 230
Lemberg, J., Cited on testing minerals..... 247
Lesley, J. P., Cited on gas pressure..... 196
— — — Pocono sandstone..... 192
— — — *Scolithus*..... 36, 41
—, Criticisms of "anticlinal theory" by..... 215
Lesquereux, Leo, Cited on prairies..... 73
Leverett, Frank, Cited on drift..... 135
—, Record of discussion by..... 134, 151
Lévy, Michel, Cited on thermometamorphism..... 16
Lewis, H. C., Cited on Pleistocene submergence..... 510
— — — shell deposits..... 506
—, Tribute to..... 455
Liassic fossil from California..... 436
Library, Institution of a..... 468
Lima *acuta*, Naming of species..... 398
— *dilleri*, Naming of species.. 404
—, New species of..... 402, 405
— *taylorensis*, Naming of species..... 405
Lindahl, Josua, Cited on glacial deposits..... 138
Lindenkohl, A., Cited on submerged channels 486
Lindstrom, Gustav, Cited on Paleozoic corals 257
Litchfield, Elecolite-syenite of..... 231
Litchfieldite, Application of name..... 243
Lithographic limestone, Definition of..... 288
Little York, Extra-morainic drift at..... 177
Llano Estacado, Structure of the..... 85
Logan, Sir W. E., Cited on *Scolithus*..... 34, 37
Long, S. H., Explorations by cited..... 333
Lonsdale, William, Cited on Paleozoic corals. 255
LopER, S. W., Collections by..... 168
Lord, M. W., Resolution of thanks to..... 522
Loriol, Perceval, de, Cited on echinoids..... 104
Lossen, L. A., Cited on thermometamorphism 16
Loughridge, R. H., Cited on Texas deposits.. 92
Louisiana limestone, Definition of..... 289
—, Section at..... 286
Lower Magnesian, Abandonment of term..... 464
Lower Silurian, Composition of the..... 349
—, General section of the..... 359
Lundbohn Hjalmar, Attendance of, at Columbus meeting..... 522
Lyell, Sir Charles, Cited on glacial lakes... 484

McConnell, R. G., Cited on overthrust faults.. 393
McCoy, Frederick, Cited on Paleozoic corals. 255
Macfarlane, Thomas, Record of discussion by..... 22
McGee, W J, Acknowledgment to..... 341
—, Cited on glacial episodes..... 181
— — — kames..... 145
— — — Oneota formation..... 341
— — — Saint Peter sandstone..... 350

Page

McGee, W J, Cited on Texas deposits..... 92
— — — the Columbia formation..... 94, 230
—, Discussion of isostasy by 504
—, — — Paleozoic formations by..... 464
— — — the geologic formations of the Rio Grande by 483
—, Election of as Editor..... 454
—, Organization of party by..... 511
—, Reading of papers by..... 484, 508, 511, 512
—, Record of discussion by 492
—; The Gulf of Mexico as a measure of isostasy..... 501
Macluræa bed, Description of..... 365
Macon, W. H., Acknowledgments to..... 233
Magnesian formation, Application of term... 464
— series, Definition of..... 340
Maine, Drift of..... 139
—, Elecolite-syenite of..... 83, 231
Manitoba, Drift of 141
Mannington (The) oil field and the history of its development; I. C. White..... 187
Map (A geological) of South America; Gustav Steinmann..... 13
Maquoketa bed, Description of..... 365
Marcou, Jules, Cited on the Mesozoic of California..... 396
— — — — Jurassic of North America..... 409
Mare, J. E., Cited on volcanic rocks..... 17
Marshall group, Note on the establishment of..... 9
Martin, W. S., Cited on altitudes 506
Massachusetts, Cambrian rocks of..... 519
—, Drift of 140
—, Elecolite-syenite of..... 83
—, Schistose rocks of..... 460
Meeds, A. D., Cited on Potsdam sandstone... 335
Meek, F. B., Cited on California fossils... 397, 414
— — — — geology..... 370
— — — Jurassic fossils. 409
— — — — of California 425, 438
— — — Kinderhook beds 287
Megalonyx (The Pelvis of a) and other bones from Big Bone cave, Tennessee; J. M. Safford..... 121
Mell, P. H., Donation of photographs by..... 372
Melville, W. H., Acknowledgments to..... 232
—, Analysis of elecolite-syenite by..... 238
Memorial of J. F. Williams..... 455
Merrill, F. J. H., Cited on Pleistocene terraces 487
—, Record of discussion by..... 134
Merrill, G. P., Acknowledgments to..... 233
—, Donation of photographs by..... 471
—, Resolution of thanks to 151
Metamorphism of igneous rocks..... 16
Mexico (Gulf of), Tertiary rocks of the..... 47
Mexico, Remarks on the geology of..... 483
—, Structure of northern..... 94
Meyer, Victor, Tribute to..... 456
Michigan, Episodes in the history of the university of..... 10
— — — — survey of 8
Middleton formation (Note on the) of Tennessee, Mississippi and Alabama; J. M. Safford..... 511
Miller, Hugh, Cited on till formation..... 137
Miller, S. A., Cited on Carboniferous echinoids 102
— — — *Lingula* 352
— — — Paleozoic corals..... 257
—, Quoted on *Scolithus* 38
Mills, J. E.; Stratigraphy and succession of the rocks of the Sierra Nevada of California..... 413
—, Title of paper by..... 460
Milne-Edwards, J., Cited on Paleozoic corals 254
Mindeleff, Cosmos, Photograph by..... 481
Mines, Coal 318
Minnesota, Drift of..... 140
—, Paleozoic formations of..... 331, 464
—, Prairies of 72

	Page
Minshall, F. W., Cited on natural gas	204
— — — on the origin of petroleum	193
Miocene deposits of Gulf slope	128
— faunas	105
— rocks of California	372
Mississippian section (The principal); C. R. Keyes	283
Mississippi basin, Pre-Pleistocene gravels in the	183
—, Middleton formation of	511
— river, Sections on	284
Missouri, Coal Measures (The) and the conditions of their deposition; Arthur Winslow	109
—, Prairies of	80
—, Sections in	287
Modiola, New species of	402
— *triquætræformis*, Naming of species	398
Mojsisovics, A., Cited on subdivisions of the Trias	399
Monostychia, Transfer of species to	105
Monotis bed, Description of	397
Montana coal fields (Two); W. H. Weed	301
—, Geology of Crazy mountains in	445
Montgomery, A. J., Acknowledgment to	198
Montgomery limestone	376
Montlivaultia (?), New species of	401
Moore, Charles, Cited on the Jurassic of Australasia	409
Moraine, Drift beyond the terminal	173
Mormon sandstone, Description of	373, 403
Morrell, H. K., Acknowledgments to	232
Morris, John, Cited on Paleozoic corals	256
Morton, S. G., Cited on echinoids	105
Mortonia *rogersi* redefined	105
Mount Bethel, Extra-morainic drift at	177
Mount Morris, Section at	189
Muir, John, Quoted on the geology of Alaska	499
Munthe, H., Cited on shore lines	67
Murchison, R. I., Cited on Russian "black earth"	68
— — — *Eurypterus* beds	59
— — — *Scolithus*	36
—, Quotation from "Silurian System" of	255
Myacites, New species of	398
Mytilus, New species of	402, 404

Nansen, Fridtjof, Cited on Arctic ice	138
Nason, H. B., Tribute to	455
Nathorst, G. A., Cited on *Scolithus*	40
— — — the glacial theory	72
Natural Bridge, Pleistocene shore lines near	489
Natural bridges of Florida	132
Nebraska, Geology of	519
—, Sandstone dikes in	50
Neocene deformation	85
— deposits of California	372
— — — the Plains	519
Newberry, J. S., Age of Great Falls formation determined by	322
—, Cited on Coal Measures	120
— — — fossil plants	302
— — — glacial drift	304
— — — lakes	484
— — — Pleistocene terraces	487
— — — *Scolithus*	36
— — — the origin of petroleum	193
— — — *Unio* from Montana	310
New Brunswick, Ice work near	179
New England, Drift of	139
—, Effects of droughts and winds in	148
New Hampshire, Drift of	139
—, Hornblende-syenite from	231
New Jersey, Eleolite-syenite of	83
—, Extra-morainic drift in	173
—, Triassic of	25
New Mexico, Geology of	85
—, Triassic of	25
New Richmond sandstone, Definition of	342

	Page
Newton, Henry, Tribute to	455
New York, Drift of	140
—, Pleistocene shore lines in	488
Nicholson, H. A., Cited on Paleozoic corals	257
Nicollet, J. N., Exploration by, cited	333
Nikitin SergE, Cited on glacial phenomena	70
Niles, W. H., Cited on rock stresses	519
Nordenskiold, A. E., Cited on Arctic ice	138
North Carolina, Triassic of	25
Norwood, J. G., Analysis by	358
—, Cited on Kaskaskia limestone	297
— — — Paleozoic stratigraphy	284
— — — unconformities	114
Noyes, W. A., Analysis by	358
Nucula *tenuis*, Naming of species	398

Oesel, *Eurypterus* beds of	59
Officers, List of	523
Ohio, A deep boring in	150
Oil field, The Mannington	187
Omphyma, Discussion of genus	277
Oneota formation, Relations of	342
— limestone, Application of term	464
Opis bed, Description of	403
"Orange sand," Age of the	183
Organisms (Studies in problematic)—the genus *Scolithus*; J. F. James	32
Orthisina bed, Description of	204
Orton, Edward, Acknowledgment to	193
—, Cited on natural gas	200, 215
—, On committee on Winchell resolutions	13
—, Eulogium of Alexander Winchell by	56
—, Letter of acknowledgment from	500
—, Record of discussion by	151
—, Resolution of sympathy for	483
Osage limestone, Definition of	290
Ostræa, New species of	401
Overthrust faults	393
Owen, D. D., Cited on Kinderhook beds	288
— — — nomenclature	464
— — — the term Subcarboniferous	284
— — — — Trenton limestone	367
—, Quoted on Saint Peter sandstone	351
—, Work of, in Minnesota	334
Owen, J., Acknowledgment to	219
Oxford Furnace, Extra-morainic drift at	175
Oxytoma, New species of	407
Ozark uplift, History of the	110

Palæaster *eucharis*, Hall; A. H. Cole	512
Paleozoic formations of southeastern Minnesota; C. W. Hall and F. W. Sardeson	331
— corals	253
Pallas, P. S., Cited on "black earth"	68
Pander, C. H., Cited on fish remains	59
Pattenburg, Extra-morainic drift at	178
Paul, E. G., Collections by	373, 396
Pavlow, A.; On the Marine beds closing the Jurassic and opening the Cretaceous, with the history of their fauna	61
Peale, A. C., Cited on the Oolite	410
Peary, R. E., Cited on Arctic ice	138
Pecten *inexpectans*, Naming of species	398
— *lasseni*, Naming of species	398
—, New species of	402, 405
Pret, C. E., Cited on striated bowlders	179
Pennsylvania, Extra-morainic drift in	173
—, Oil of	188
—, Triassic of	25
Penrose, R. A. F., Jr., Cited on Texas deposits	92, 219
— — — Reynosa beds	230
—; The Tertiary Iron Ores of Arkansas and Texas	44
Periarchus *altus*, redefined	105
Permian of Texas, Discussion of the	459
—, Plants from the	117
—, Triassic and Jurassic Formations (On the) in the East Indian Archipelago; August Rothpletz	14

Page

PETROLEUM AGE (THE), Reprint from ... 288
PETROLEUM field, The Mannington ... 187
—, Origin of ... 202
PETTEE, W. H., Amendment to By-Laws proposed by ... 470
—, Cited on geology of California ... 435
—, Record of discussion by ... 160
PHINNEY, A. J., Acknowledgment to ... 193
PHOLADOMYA, New species of ... 402, 405
PHOTOGRAPHS, Report of Committee on ... 470
PICTET, F. J., Cited on Paleozoic corals ... 256
PIKE, L. M., Explorations by, cited ... 333
PINNA *cuneiformis*, Naming of species ... 404
— *expansa*, Naming of species ... 402
PINTO limestone, Description of ... 222
PITCAIRN, Pleistocene shore lines near ... 489
PLAINS, Geology of the ... 519
PLEISTOCENE, Boring in the ... 150
— changes of level ... 65
— deposits ... 124, 134
— — in England ... 505
— —, Interior ... 95
— — of California ... 372
— — — New Jersey ... 176
— — — Russia ... 68
— — — the Plains ... 519
— — — Texas ... 85
— (Pre-) gravels of the Mississippi basin ... 183
— subsidence ... 508
— terraces ... 487
PLEUROMYA, New species of ... 402
PLIOCENE echinoid faunas ... 107
POCONO sandstone, Oil from the ... 188
POTOMAC flora, Derivation of the ... 25
POTSDAM sandstone of Minnesota ... 335
POWELL, J. W., Donation of photographs by ... 480
—, Cited on the Klamath mountains ... 374
— — — Triassic deposits ... 25
PRIBILOF islands (Geology of the); Joseph Stanley-Brown ... 496
PROCEEDINGS of the Fourth Annual Meeting held at Columbus, Ohio, December 29, 30 and 31, 1891; H. L. Fairchild ... 453
— — — Summer Meeting held at Washington, August 24 and 25, 1881; H. L. Fairchild ... 1
PROCESSES (Peculiar geologic) on the Channel islands of California; L. G. Yates ... 133
PTEROPENNA, New species of ... 404
PTYCHOPHYLLUM, Discussion of genus ... 278
PUBLICATION, Rules relating to ... 467
PUMPELLY, RAPHAEL, Reference to, as chief of division ... 461

QUARTZ veins of California ... 440
QUATERNARY changes of level in Scandinavia; G. de Geer ... 65
QUENSTEDT, F. A. VON, Cited on *Ammonites* ... 404

RAVENEL, EDMUND, Cited on echinoids ... 105, 107
RECLUS, ELISÉE, Cited on Russian steppes ... 80
RED HILL, Hornblende-syenite from ... 230
RED LODGE mines ... 326
—, Section at ... 327
REGISTER of the Columbus meeting ... 522
— — — Washington meeting ... 152
REID, H. F., Cited on Alaskan glaciers ... 507
—, Donation of photographs by ... 478
REPORT of the Council ... 466
REUSCH, HANS, Cited on rock structure ... 515
REVISION of the genus *Chonophyllum* ... 253
REYNOSA beds, Description of ... 229
RHABDOCERAS bed, Description of ... 398
— *russelli*, Naming of species ... 398
RHACOPHYLLITES, New species of ... 407
RHYNCONELLA, New species of ... 404
— *solitaria*, Naming of species ... 398
RIO GRANDE (Notes on the geology of the valley of the middle); E. T. Dumble ... 219

Page

ROBERTSON, J. B., Collections by ... 110
ROBINSON beds, Description of ... 374
ROCK species from Maine and New Hampshire ... 231
ROCKY FORK coal fields ... 324, 329
ROCKY mountains, Structure of southern ... 86
ROEMER, F., Cited on TEXAS deposits ... 92
ROGERS, H. D., Cited on rock structure ... 208
— — — *Scolithus* ... 35
ROGERS, W. B., Cited on *Scolithus* ... 32
— — — Triassic plants ... 24
ROMON, I., Cited on fish remains ... 59, 169
RÖMINGER, KARL, Quoted on Paleozoic corals ... 255
—, Specific name suggested by ... 274
ROSENBUSCH, H., Cited on biotite ... 236
— — — eleolite-syenite ... 84, 236
— — — theralite ... 450
—, Tribute to ... 456
ROTH, JUSTUS, Cited on rock composition ... 19
ROTHPLETZ, AUGUST; On the Permian, Triassic and Jurassic formations in the East Indian Archipelago ... 14
ROTTI, Formations of ... 14
ROUMANIA, *Dinotherium* in ... 81
RUPRECHT, F. J., Cited on "black earth" ... 69
RUSSELL, I. C., Acknowledgments to ... 396
—, Cited on Alaskan glaciers ... 507
— — — California geology ... 371
— — — glacial deposits ... 138
—, Collections by ... 153, 395
—, Dedication of species to ... 398
—, Discussion of Iroquois shore lines by ... 494
—, Photographs by ... 480
—, Record of discussion by ... 493
—, Title of paper by ... 465
RUSSIA, "Black earth" of southern ... 68
RUTLAND, Geology of ... 515

SAFFORD, J. M; Note on the Middleton formation of Tennessee, Mississippi and Alabama ... 511
—; The pelvis of a *Megalonyx* and other bones from Big Bone cave, Tennessee ... 121
—, Title of paper by ... 121
SAINT ELIAS mountains, Structure of ... 495
SAINTE GENEVIEVE, Section at ... 287
SAINT GEORGE island, Geology of ... 498, 499
SAINT LAWRENCE limestone, Definition of ... 342
— valley, Glacial lakes of ... 486
SAINT LOUIS limestone, Definition of ... 294
—, Section at ... 286
SAINTE MARY, Section at ... 287
SAINT PAUL island, Geology of ... 496
—, Section at ... 354
SAINT PETER sandstone, Definition of ... 350
SALISBURY, R. D.; Certain extra-Morainic drift phenomena of New Jersey ... 173
—, Cited on drift ... 136
— — — the driftless area ... 332
—; On the northward and eastern extension of the pre-Pleistocene gravels of the Mississippi basin ... 183
—, Title of paper by ... 134
—, Record of discussion by ... 133
SALOMON, ALEXANDER, Cited on thermometamorphism ... 16
SALTER, J. W., Cited on *Scolithus* ... 35
SANDCOULÉE, Section at ... 314
SANDSTONE dikes in western Nebraska; Robert Hay ... 50
—, Purity of the Saint Peter ... 351
SAN MIGUEL beds, Description of ... 224
SARDESON, F. W., Cited on the Lower Silurian ... 358
—, Finding of Saint Peter fossils by ... 352
— (C. W. Hall and); Paleozoic formations of southeastern Minnesota ... 331
—, Title of paper by ... 464
SAUER, A., Cited on thermometamorphism ... 16
SCANDINAVIA, Changes of level in ... 65

Page

Schlüter, Carl, Acknowledgments to..... 257
Schmidt, V., Cited on shore lines..... 67
Schmidt, Friedrich, Discussion of Silurian fish remains by 168
—, Record of discussion by..... 23
—; The *Eurypterus* beds of Oesel as compared with those of North America..... 59
Schwatka Frederick, Exploration by..... 495
Science, Reprint from..... 206
Scolithus *clintonensis*, Proposal of name..... 33
— *minnesotensis*, Proposal of name..... 41
— *minutus*, Description of..... 38
—, Review of the genus..... 32, 43
— *sheperdi*, Proposal of name..... 32
Scutella *rogersi* renamed..... 105
Seal islands, Geology of the 496
—, Transportation of pebbles by the..... 497
Seely, H. M., Quoted on *Scolithus*..... 42
Selwyn, A. R. C., Donation of photographs by..... 481
—, Cited on Canadian oil fields..... 194
Serpentines of California 430
Shakopee dolomite, Definition of..... 342
Shaler, N. S., Cited on drift..... 143
—, Record of discussion by..... 44, 133
Sheldon, E. P., Analysis by..... 348
Shell bed (Supposed inter-glacial) in Shropshire, England; G. F. Wright. 505
Sherrill, J. G., Cited on drift 144
Sherzer, W. H.; A revision and monograph of the genus *Chonophyllum*..... 253
—, Record of discussion by..... 504
—, Title of paper by..... 484
Shoo-fly beds, description of..... 375
Shropshire, Shell beds in. 505
Shumard, B. F., Analyses reported by..... 348
—, Cited on Cambrian conglomerates..... 336
— — — Osage limestones 290
— — — Saint Louis limestone..... 294
— — — Texas deposits..... 92
— — — unconformities. 107
Shumard, G. G., Cited on Picocho peak..... 99
— — — the Jornado basin 97
Sidener, C. F., Analysis by 348
Sierra Nevada, Rocks of the..... 413
—, Structure of the..... 370
Sihleano, Stefan, Translation by..... 81
Silurian formations of Minnesota 464
— fish remains 59
— of California 372
— — Minnesota 332
— — the Green mountains..... 514
— vertebrates 153
Simonsohn, ——, Collections by 59
Sismondia *marginalis* renamed 105
— *plana* renamed..... 105
Sjögren, A., Cited on European oil fields..... 194
Smith, E. A., Cited on Middleton formation.. 511
Smith, M. M., Acknowledgments to..... 233
—, Collection by..... 244
Smith, W. C., Analysis by..... 348
Smock, J. C., Cited on extra-morainic drift... 174
—, Election of, on auditing committee..... 454
South America, Geologic map of 13
South Colton, Pleistocene shore lines near.. 489
Sowter, T. W. E., Cited on *Scolithus*..... 41
Species, Description of..... 38
—, Founding of..... 165, 275
—, Naming of 41, 397
—, Renaming of 32, 33, 105
Spencer, J. W.; Channels over divides not evidence per se of glacial lakes..... 491
—, Cited on bowlder pavements..... 66
— — — glacial lakes..... 484
— — — Pleistocene shore lines 493
—, Discussion of Iroquois shore lines by..... 494
—; The Iroquois shore north of the Adirondacks..... 488
Sperr, F. W., Resolution of thanks to..... 522
Sphæroceras bed, Description of..... 403
—, New species of..... 405

Page

Stanley-Brown, Joseph; Geology of the Pribilof islands 496
—, Photographs by..... 481
Stanton, T. W., Cited on fossils from Montana 310
—, Collections by..... 153
Stefanescu, Gregoire; On the existence of the *Dinotherium* in Roumania..... 81
Stein, Robert, Translation by 68
Steinmann, Gustav; A geological map of South America 13
—, Cited on the Jura of South America..... 409
Steppes, "Black earth" of the..... 68
Stevenson, J. J., Cited on Coal Measures..... 120
— — — rock structure 208, 211
— — — the origin of petroleum 193
—, Honorary election of. 469
Stictopora bed, Description of..... 361
Stictopora bed, Description of 362
St. John, Orestes, Cited on mount Capulin... 99
Stockbridge limestone (On the structure and age of the) in the Vermont valley; T. N. Dale 514
Stoddard, S. R., Donation of photographs by.. 474
Stokes, H. N., Analysis by..... 317, 321
Stone, G. H., Cited on kames..... 145
— — — till..... 139
Storrs, James, Collections by..... 396
Straight coulee, Section in..... 313
Stratigraphy and succession of the rocks of the Sierra Nevada of California; J. E. Mills 413
— of California..... 412, 438
— — Montana 302
— — Minnesota..... 368
— — the Mississippi valley..... 298
Strong, Moses, Cited on the Potsdam sandstone 340
Structure of California rocks 387
— — gneiss..... 463
— — the Sierra Nevada 415
— — — Stockbridge limestone 514
Stur, Dionys, Cited on Triassic plants..... 29
Stylina *alba*, Naming of species 408
— bed, Description of..... 407
— *intermedia*, Naming of species..... 408
— *minuta*, Naming of species..... 408
— *subjecta*, Naming of species 408
— *tertia*, Naming of species. 408
Surface, H. A., Resolution of thanks to..... 522
Swallow, G. C., Cited on Kinderhook beds... 288
— — — unconformities 110, 114
Swearinger slate, Description of..... 374, 397
Sweden, Fossil coral from 257
Sweet, E. T., Cited on the Potsdam sandstone 339
Synclinal folds in northern California..... 389

Taff, J. A., Cited on Reynosa beds..... 230
Tarr, R. S., Cited on mount Capulin..... 99
Taylorville, Jura and Trias at..... 395
— region, Geology of the..... 369
— slates, Description of..... 376
Tennessee, Fossil bones from..... 121
—, Middleton formation of..... 511
Terraces, Pleistocene..... 487
Tertiary beds of Nebraska 51
— — — Roumania..... 81
— — — South America 13
— gravels of the Mississippi basin..... 183
— iron ores..... 44
Texarquito creek, Section on 223
Texas, Cretaceous formations of 521
—, Fossil plants from 217
—, Geology of 219
—, Iron ores of 44
—-New Mexican region (Notes on the); R. T. Hill. 85
—, Remarks on the geology of..... 483

Page

THERALITE in the Crazy mountains.. 450
THERMOMETAMORPHISM in igneous rocks; Alfred Harker..... 16
THOMPSON limestone, Description of..... 373, 403
TIERRA BLANCA, Definition of term..... 89
TIFFANY, A. S., Record of discussion by..... 81
TIMOR, Formations of 14
TÖRNEBOHM, A. E., Cited on rock structure... 238
TRAIL beds, Description of..... 374
TRASK, J. D., Collections by..... 414
TRENTON fish remains..... 158
— limestone, Analyses of..... 358
— —, Definition of 356
TRIAS and Jura of California..... 395
— (The plant-bearing deposits of the American); Lester F. Ward 23
— of Alaska 495
— — California 372
TRIGONIA bed, Description of 406
— *naviformis*, Naming of species..... 407
—, New species of..... 402, 405
— *obliqua*, Naming of species 407
— *plumascensis*, Naming of species..... 407
TSCHERNYSCHEW, TH., Cited on European oil fields 194
TYOMEY, M., Cited on echinoids..... 105, 107
TURNER, H. W., Cited on California geology..... 371, 372
— — — faulting..... 393
TYRRELL, J. B., Photographs by 482

ULRICH, E. O., Cited on Trenton shales..... 349
UNCONFORMITIES in California 378
— — Minnesota 353
— — the Sierra Nevada..... 428
UPHAM, WARREN, Acknowledgments to 335
—, Cited on Cambrian conglomerates..... 337
— — — glacial lakes 491
— — — Minnesota stratigraphy..... 341
— — — mountain structure 452
— — — Pleistocene terraces 487
—; Inequality of distribution of the englacial drift 134
—, Record of discussion by 133
—, Reference to field work of. 493
— — — opinions of..... 488, 490
—; Relationship of the glacial lakes Warren, Algonquin, Iroquois and Hudson-Champlain 484
—; The Champlain submergence 508
UPSON clays, Description of..... 224

VAL VERDE flags, Description of 221
VANDERGRIFT, J. J., Acknowledgment to. 193
VAN HISE, C. R., Cited on interstitial growth 336, 345
— — — supposed Huronian rocks..... 335
—, Committee on Winchell resolutions..... 13
—, Eulogium of Alexander Winchell by..... 58
—, Record of discussion by... 22, 55, 124, 127, 134
—, Resolution of thanks by 151
VANUXEM, LARDNER, Cited on *Scolithus* 33
VERMICERAS *crossmani*, Naming of species ... 411
VERMICULAR sandstone, Definition of 288
VERMONT, Stockbridge limestone of..... 514
VERRILL, A. E., Cited on Paleozoic corals..... 262
VERTEBRATES, Silurian..... 153
VIRGINIA, Triassic of 25
VOLCANIC areas of New Mexico..... 98
— rocks of California 376, 421
— — — Lake district 22
VULCANISM in Alaska 495, 496
— — Montana 448

WAAGEN, W., Cited on Indian paleontology... 14
— — — the Jurassic of India..... 409
WACHSMUTH, CHARLES, Letter from, on California fossils 428

Page

WADSWORTH, M. E., Cited on peridotites from California 431
WALCOTT, C. D., Cited on age of "Quartz rock" 37
— — — California fossils..... 371
— — — Carboniferous fossils..... 308
— — — *Scolithus* 34, 42
—, Identification of fossils by..... 375, 376, 516
—, Photographs by..... 480
—; Preliminary notes on the discovery of a vertebrate fauna in Silurian (Ordovician) strata. 153
—, Record of discussion by 55
—, Title of paper by 23
WANNER, ATREUS, Cited on *Scolithus* 41
WARD, LESTER F., Discussion by 15
—, Record of discussion by 31
—; The plant-bearing deposits of the American Trias 23
WARREN, Lake..... 484
WARSAW beds, Definition of..... 293
—, Section at 286
WATERTOWN, Pleistocene shore lines near.... 488
WEBB bluff, Section at..... 228
WEED, W. H., Cited on Cretaceous rocks of Montana..... 446
— — — Montana coal fields..... 309
—, Photographs by..... 481
—; Two Montana coal fields 301
WELLING, J. C., Welcome on behalf of..... 2
WESTON, T. C., Photographs by... 482
WEST VIRGINIA, Oil field in... 187
—, Permian fossils of..... 217
WHEELER, G. M., Cited on altitudes 418
WHITE, C. A., Cited on Carboniferous fossils.. 308
— — — Coal Measures 120
— — — Cretaceous fresh water fossils 330
— — — of Texas..... 224
— — — geology of California 414, 425, 438
— — — Jurassic fossils..... 409
— — — Kinderhook beds 289
— — — Osage limestone 291
— — — Permian fossils..... 217, 459
— — — principles of correlation..... 44
— — — Saint Louis limestone..... 295
— — — supposed Huronian rocks..... 335
— — — unconformities..... 110
—, Committee on Winchell resolutons 13
—, Discussion by..... 14
—, Eulogium of Alexander Winchell by..... 58
—, Quoted on Paleozoic corals..... 272
WHITE, I. C., Cited on Coal Measures..... 120
— — — the "anticlinal theory"..... 193
—, Discussion of isostasy by..... 503
—, Election of, as Treasurer 454
—; Fossil plants from the Wichita or Permian beds of Texas..... 217
—, Record of discussion by 460
—; The "anticlinal theory" of natural gas.. 204
—; The criticisms of the "anticlinal theory" of natural gas..... 215
—; The Mannington oil field and the history of its development..... 187
—, Titles of papers by..... 459
WHITEAVES, J. F., Acknowledgment to..... 269
WHITE RIVER formation in Nebraska..... 519
WHITFIELD, R. P., Cited on Carboniferous fossils..... 309
— — — Jurassic fossils..... 410
— — — Paleozoic corals..... 257
— — — *Scolithus*..... 39
WHITNEY, J. D., Cited on altitude of mount Whitney 416
— — — *Ammonites colfaxii*..... 436
— — — California geology..... 370, 397, 414, 438
— — — prairies 73
— — — quartz veins..... 442, 444
— — — the Sierra Nevada 419, 423
—, Quoted on the Sierra Nevada 426
WHITTLESEY, C. C., Cited on glacial lakes..... 484
WICHITA beds, Discussion of 459

Page

Wichita beds, Plants from 217
Williams, G. H., Donation of photographs by. 571
—, Cited on thermometamorphism 16
—, Record of discussion by..... 84
Williams, H. S., Cited on Kinderhook beds.. 289
— — — name Mississippian..... 283
— — — Osage limestone 290
—, Collection by 323
—, Election of, as councillor..... 454
Williams, J. F., Cited on eleolite-syenite 84
—, Record of death of..... 466
— — — discussion by 84
— (Memorial of); J. F. Kemp..... 455
Willis, Bailey, Resolution of thanks to..... 151
—, Title of paper by..... 55
Winchell, Alexander, Acknowledgment to.. 254
—, Cited on name Mississippian 283
—, Eulogium of 56
—, Memorial sketch of..... 3
—, Portrait of..... facing 1
—, Record of death of..... 466
Winchell, H. V., Analyses by..... 358
Winchell, N. H., Acknowledgments to 335
—, Cited on *Cryptozoon*..... 344
— — — drift.. 142
— — — glacial deposits 138
— — — Minnesota stratigraphy..... 341
— — — prairies..... 73
— — — *Scolithus*..... 41
— — — the Potsdam sandstone 339
—, Election of, as councillor..... 454
—, Finding of Saint Peter fossils by 352
—, Memorial sketch by..... 3
—, Record of discussion by 134
Winds and drought, Effects of 148
Wing, Augustus, Cited on *Scolithus* 38
— — — the Stockbridge limestone..... 518
Winslow, Arthur, Acknowledgments to..... 287
—, Record of discussion by.. ..... 459, 495
—, Resolution of sympathy for Professor Orton by..... 483

Page

Winslow, Arthur; The Missouri Coal Measures and the conditions of their deposition..... 109
Wisconsin, Paleozoic formations of..... 464
Wolff, J. E., Cited on Cambrian rocks..... 515, 517, 518
— — — geology of Massachusetts..... 461
— — — Rocky Fork coal fields..... 325
— — — the Crazy mountains..... 446
—, Discussion of secondary banding in gneiss by..... 464
—, Exhibition of views by 465
—, Reading of paper by..... 514
—, Record of discussion by..... 55, 84, 492, 511
—; The geology of the Crazy mountains, Montana..... 445
—, Title of paper by..... 495
Woodhull, D. S., Dedication of species to..... 411
Worthen, A H., Cited on Kaskaskia limestone 297
— — — Kinderhook beds 287
— — — Tertiary gravels..... 186
Worthington, John, Acknowledgment to..... 191
Wright, A. A., Identification of fossils by..... 505
Wright, G. F., Record of discussion by..... 465, 492, 504
—; Supposed inter-glacial shell beds in Shropshire, England..... 505
—, Title of paper by..... 504
Wykoff bed, Description of..... 366

Yates, L. G.; Peculiar geologic processes on the Channel islands of California 133
Yukon basin (Notes on geology of the); C. W. Hayes..... 495

Zittel, Karl von, Cited on Paleozoic corals.. 257
—, Discussion of Silurian fish remains by ... 168
—, Record of discussion by 23
Zygospira bed, Description of 363